Science Department

Action Biology

Elective Full Year
Grade(s)10-12
A Level
Prerequisite:
Introductory Physics and teacher recommendation

Action Biology is designed to give students a general introduction to ecology, chemistry of life, cell structure and function, genetics, evolution and biodiversity, as well as selected topics including plant, animal, and human physiology. Students are involved with numerous laboratory activities and discussions that provide an understanding of biology as it relates to our daily lives and our activities as citizens.

Advanced Placement Biology

Elective Full Year
Grade(s)11-12
Advanced Placement
Prerequisite:
B or better in both Honors Biology and Honors Chemistry, teacher recommendation and permission of instructor.

This course is designed to be the equivalent of a first year college biology course given to science majors. By achieving a certain proficiency on the Advanced Placement examination given in May, credit may be granted at a number of colleges. Using a college textbook, the course is an in-depth study of the fundamentals of biology and focuses on the requirements established by the College Board. Twelve predetermined laboratory projects will be completed during the year. Each lab involves considerable analysis of data. Frequent outside reading assignments will also be required. Summer reading and/or a special project are required. Students must take the AP exam in the spring. This cours is an excellent preparation for the SAT II.

Advanced Placement Chemistry

Elective Full Year
Grade(s)11-12
Advanced Placement
Prerequisite:
B or better in both Honors Chemistry and a honors math course, teacher recommendation and permission of instructor.

Advanced Placement Chemistry is designed to be the equivalent of a general chemistry course taken in college and focuses on the requirements established by the College Board. Emphasis will be on quantitative reasoning skills and development of models that summarize large amounts of data which explain chemical phenomena and enable predictions. AP Students will be expected to write explanations to non-quantitative questions and to conduct mathematical manipulations in preparation for the AP Chemistry exam given in May. Summer reading and/or a special project may be required. The course can be taken in either the junior or senior year. Students must take the AP exam in the spring. This course is an excellent preparation for the SAT II.

Advanced Placement Physics

Elective Full Year
Grade(s)11 -12
Advanced Placement
Prerequisite:
Honors Introductory Physics and B in Algebra II , Advanced Math I or Honors Algebra II and teacher recommendation

This course will cover the same topics as in Honors Physics but with greater rigor. Topics include: mechanics, electricity and magnetism, thermal physics, waves and optics, and atomic and nuclear physics. Students need to be familiar with algebra and trigonometry. Calculus, if used, will apply to some theoretical developments and will require only a basic understanding. The course is principally designed to develop students' ability to interpret and analyze physical information presented in verbal, mathematical and graphical from and hence is a problem solving course. The laboratory component will engage students in designing experiments, determining uncertainties in measurement, drawing inferences and communicating results. Students must take the B version AP exam in the spring.

Science Department

Basic Introductory Physics

Elective Full Year
Grade(s)9-10
A Level
Prerequisite:
Teacher recommendation

This course is a conceptual study of Basic Introductory Physics. Students will study the practical problems found in physics which include: scientific method, motion, force, energy, heat, light, and atomic structure. Since all concepts are developed through activities and laboratory work, class attendance is vitally important. Regular laboratory reports and homework will be collected. Teachers will emphasize the close association between science and technologies and integrate appropriate technology experiences.

Bioethics

Elective Semester
Grade(s)12
A Level
Prerequisite:
Honors Biology or Biology and teacher recommendation

Bioethics provides students with an opportunity to examine and discuss the social, ethical and legal dilemmas that arise from advances in medicine and biotechnology. Potential topics include organ donation and transplantation, abortion, assisted reproduction, euthanasia and assisted suicide, death and dying, environmental ethics, medical ethics, animal research and genetic technologies. Research-based projects or assignments are part of the curriculum. Students who want to take this course for honors credit must execute a written agreement with the teacher for additional work.

Biology

Elective Full Year
Grade(s)10-12
A Level
Prerequisite:
Introductory Physics and teacher recommendation

Biology is designed to give students an introduction to ecology, chemistry of life, cell structure and function, genetics, evolution and biodiversity, as well as selected topics including plant, animal, and human physiology. Practical laboratory exercises following the scientific method will provide the student with experiences in biological problem solving. These exercises are designed to reinforce the material taught and discussed in class.

Chemistry

Elective Full Year
Grade(s)10-12
A Level
Prerequisite:
Teacher recommendation

An understanding of basic chemical principles becomes increasingly important in our changing technological world. This course will fulfill college entrance requirements as well as provide a basis for further science courses. Chemistry is the science dealing with the structure and composition of substances and the mechanisms by which changes in composition occur. The relationships between matter and energy as well as the correlation of structure and properties is a major theme. Emphasis is placed on experimentation, use of scientific method, and problem solving in which math skills are applied. Daily assignments are given. Projects allow students to go beyond the scope of the textbook and to further explore current topics and issues in chemistry.

Science Department

Earth Science

Elective Full Year
Grade(s)9
A Level
Prerequisite:
Teacher rcommendation

Earth science is an exciting and dynamic field and is designed to pilot an introductory course at the high school. As in Introductory Physics, skills in laboratory procedures, quantitative manipulations and graph interpretations are developed but are associated with Earth and Space Science. Course topics include: matter and energy in the Earth system, the Earth's sources of energy, Earth processes and cycles, and the origin and evolution of the universe. Some physics principles will also be introduced. This course builds on prior knowledge from the eighth grade curriculum but provides the depth of understanding associated with the state frameworks for grades 9 and 10. This course is an excellent preparation for future science courses.

Honors Biology

Elective Full Year
Grade(s)9-10
Honors
Prerequisite:
B+ or better in Honors Algebra I or Honors Geometry, A in Algebra I, Integrated Algebra/Geometry II and B+ in previous year's science course and teacher recommendation

Honors Biology is a course designed for students who demonstrate high academic achievement and motivation in science and mathematics. Students will be expected to complete a significant amount of reading and writing assignments as well as quantitative and qualitative analysis of laboratory work. Topics emphasized include ecology, chemistry of life, cell structure and function, genetics, evolution and biodiversity, as well as selected topics including plant, animal, and human physiology.

Honors Chemistry

Elective Full Year
Grade(s)10-12
Honors
Prerequisite:
B in a honors math course or B+ in Integrated Algebra/Geometry II and teacher recommendation

The bases of this course are the fundamental principles of chemistry. Special emphasis is placed on the relationships between matter and energy as well as the correlation of structure and properties. Creative problem solving is encouraged as well as sound laboratory procedures, strengthening mathematical skills, and application of the scientific method. Emphasis is on topics of inorganic chemistry including qualitative and quantitative analysis, physical chemistry, solution chemistry, chemical kinetics, electro-chemistry, and nuclear chemistry. A high level of self-discipline is required for the completion of the assignments which can be weekly as well as daily. Projects are assigned to extend the curriculum beyond the textbook.

Honors Human Physiology

Elective Full Year
Grade(s)11-12
Honors
Prerequisite:
Honors Biology or Biology and Honors Chemistry or Chemistry and teacher recommendation

This is a course for the student interested in fields such as medicine, scientific research or biology/physical education. Lectures and laboratory experiences are designed to explore the anatomy (structure) and physiology(function) of the human body. In addition, students will compose technical papers, design and deliver self-selected oral presentations, and prepare technical and research projects.

Honors Introductory Physics

Elective Full Year
Grade(s)9-10
Honors
Prerequisite:
B+ in Honors Algebra I, Honors Geometry, A in Algebra I or Integrated Algebra/Geometry II, B+ in current science course and teacher recommendation

This course is designed for the student who shows a high interest in science and may plan to major in science or engineering in college. A strong proficiency with mathematics is essential. Students explore our understanding of matter at the atomic level during part of the academic year. The rest of the course is devoted to the study of topics in introductory physics (electromagnetism, waves, forces, velocity, acceleration, vectors and heat). Honors Introductory Physics provides an excellent foundation for Advanced Placement Physics. Teachers will emphasize the close association between science and technologies and exemplify appropriate technology applications.

Honors Physics

Elective Full Year
Grade(s)11-12
Honors
Prerequisite:
B in Algebra II, Advanced Math I, or Honors Algebra II and teacher recommendation

Highly-motivated students planning college majors in science, engineering or mathematics are urged to take this course. Areas covered include: graphical analysis of motion, kinematics, dynamics, vectors, conservation of momentum, conservation of energy, thermodynamics, light, optics, wave theory, sound, basic DC electricity, and magnetism. An inquiry approach is taken with the extensive lab work which is critical to the course. Labs will include traditional as well as computer-assisted data acquisition and analysis techniques. Students will not use this class as a prerequisite for Advanced Placement Physics.

Integrated Math and Science

Elective Semester or Full Year
Grade(s)10-12
A Level
Prerequisite:
Teacher Recommendation

This course integrates the study of science and related mathematical topics, ranging from algebra to geometry. This approach provides students with better insights into the relationship between science and mathematics and provides them the opportunity to see both as relevant and current. All concepts are developed in the laboratory, making regular class attendance vitally important. Good working habits and organizational skills will be stressed. Data will be looked at from a statistical viewpoint and graphed using technology. This course is an interdisciplinary offering sponsored by the Math and Science Departments. This course may be taken for either one or two semesters.

Introductory Physics

Elective Full Year
Grade(s)9-10
A Level
Prerequisite:
Teacher recommendation

Introductory Physics will introduce the student to fundamental physical laws that govern our universe. The approach encourages students to reason, predict, and draw conclusions based on experimental observations. Skills in laboratory procedures, quantitative manipulations, and graph interpretations are developed. Units covered include chemical behavior, forces and motion, heat, waves, light and electricity. Students are expected to keep all lab reports and discussions notes in an orderly notebook. Homework is given on a nightly basis, in order for the student to be prepared for the following day. Teachers will emphasize the close association between science and technologies and exemplify appropriate technology applications.

Lab Chemistry

Elective Full Year
Grade(s)11-12
A Level
Prerequisite:
Teacher recommendation

Students will be studying many of the practical problems associated with chemistry. All of the concepts are developed in the laboratory, making regular class attendance vitally important. Some of the topics studied will be: scientific method, chemical bonding, mixtures, solutions, nuclear chemistry, chemistry in the home and workplace, chemistry and pollution.

Physics

Elective Full Year
Grade(s)11-12
A Level
Prerequisite:
C in Algebra II or Advanced Math I and teacher recommendation

This course is recommended for students planning to attend college and needing a third year of a laboratory science. Additionally, students considering a career in any medical field should first study physics in high school before encountering physics in college. Topics include forces and motion, energy, heat, waves, light and sound, and electricity and magnetism. This course includes training in reasoning, as well as instruction in the methods and concepts of physics. There will be extensive laboratory work requiring both traditional methods and computer assisted data acquisition and analysis techniques.

Topics in Astronomy

Elective Semester
Grade(s)10-12
A Level
Prerequisite:
Teacher recommendation

This semester course is designed to familiarize students with the universe that surrounds them. The solar system, galaxies, constellations and other celestial objects are examined. The relation of outer space and the student is emphasized. Discussions using a planetarium and other optical instruments are part of the student activities. This course meets four days per cycle.